

AGENDA:

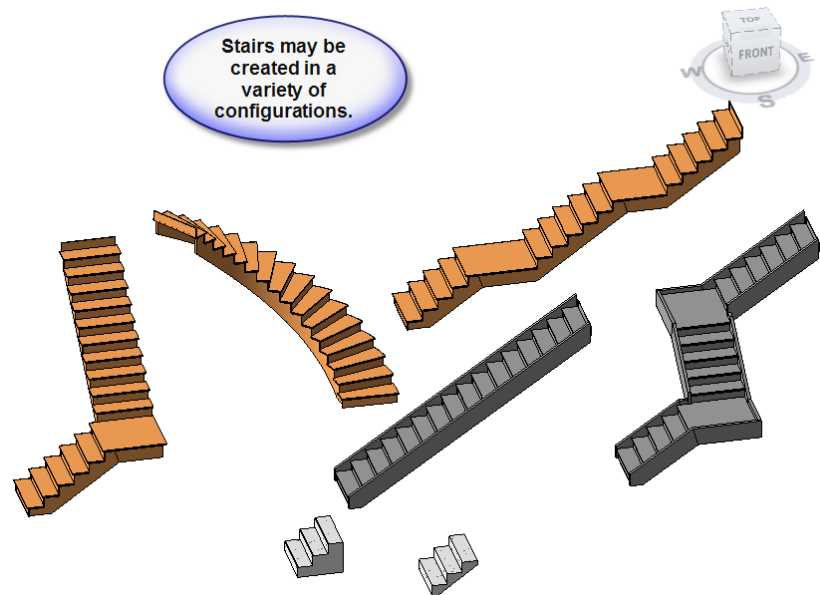
1. Introduction to Stairs and Stair Calculations
2. Creating Stairs by Components
3. Creating Stairs by Sketching

1. Introduction to Stairs

Revit allows you to create an endless variety of stair types through the use of several system families defining the critical parts used in stairs such as Runs, Landings, and Supports.

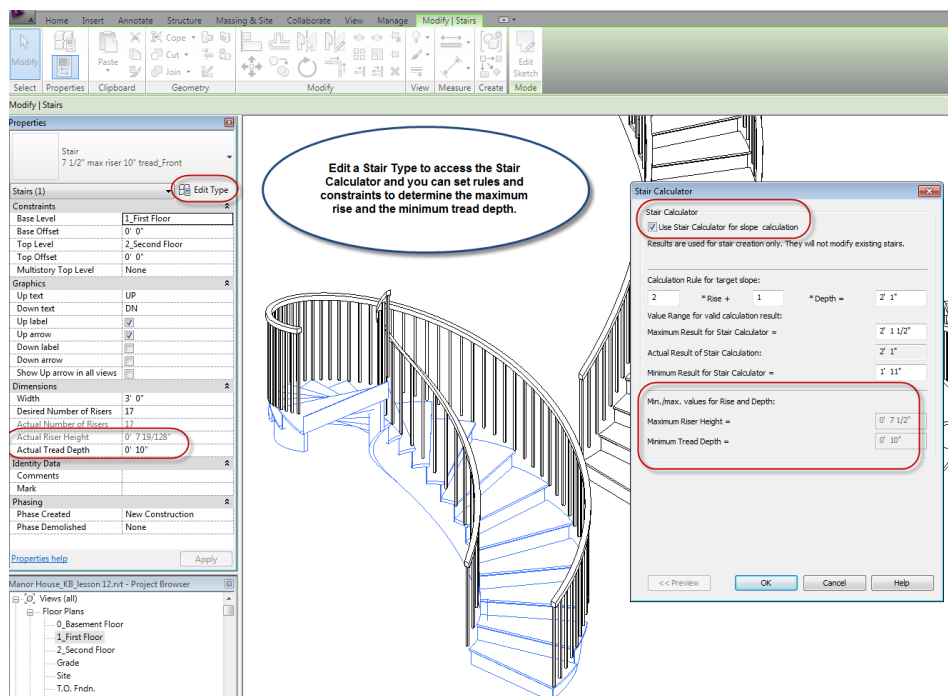
There are two main methods for drawing Stairs – Stair by Component, and Stair by Sketch. You can use the newer, Stair by Component method for virtually all types of stairs. It easily allows you to define a range of stair types from the simplest, single run of 2 steps to complex, multidirectional combinations of multiple runs and landings.

The Stair by Sketch method is the older method of stair creation and the only method prior to the addition of Stair by Component tools in the 2013 release. This traditional method allows for customization of stair and landing shapes by using sketching tools to draw the boundary and risers with lines and arcs.



Stairs may be generated as straight runs with or without intermediate landings, as L-Shaped or U-Shaped runs, in circular shapes, or in almost any other imaginable layout by using the custom boundary sketching method of stair creation. Railings may be automatically generated along with your stairs or you can create them separately using the Railing creation tool.

The Stair Calculator, available within the Type parameters for any stair, allows you to set rules for the allowable riser heights and tread lengths for your stair design. These values are linked to accepted ranges and formulas for creating a comfortable stair.



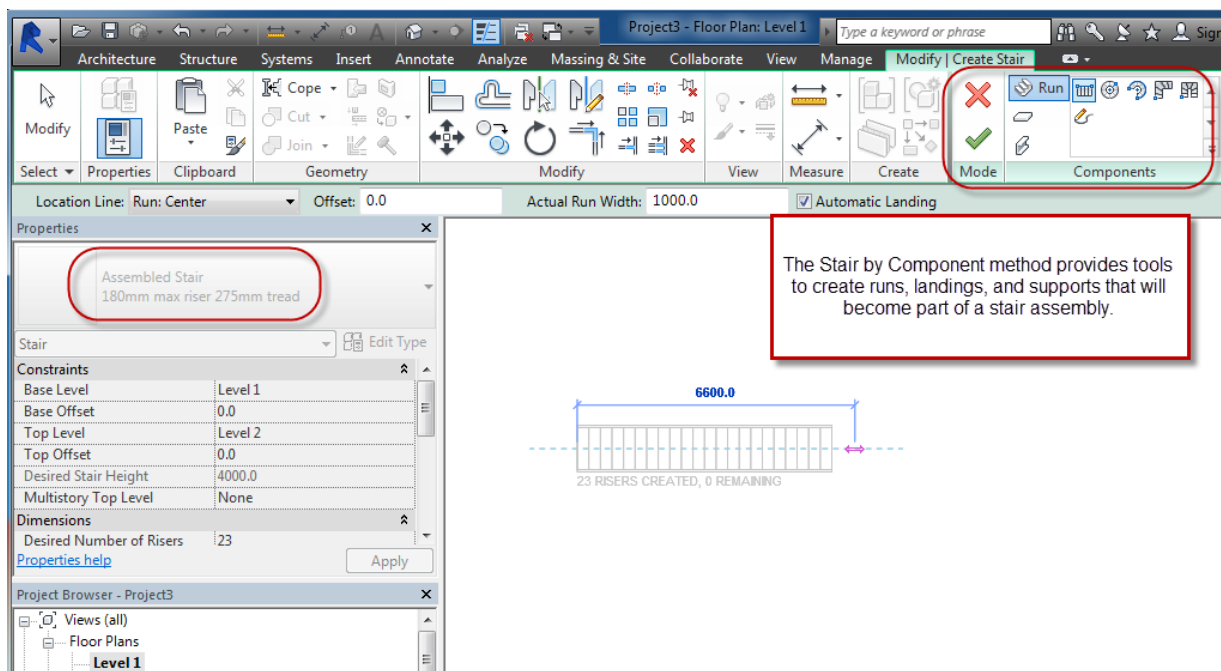
The rule shown here in the calculator as shown above is the classic $2R + T = 25$ or Two Risers plus one Tread should equal 25 inches. For a 7" riser height, the tread will be 11 inches. If you want your stairs to fit into a shorter length, you can use 7.5" for the riser and 10" for the tread. It still satisfies the comfort rule, it is likely just within the code limits for your area, and the stair will take up about 16" less space over the length of the stair.

Changing the calculation rules for a Stair Type does not affect existing stairs. Any changes you make here will be reflected in the next stair you create with that type.

When you modify the number of risers in an existing stair, the stair options bar will display a warning icon indicating the stair needs to be edited. Add or delete risers in the sketch environment to facilitate the changes specified in the properties palette.

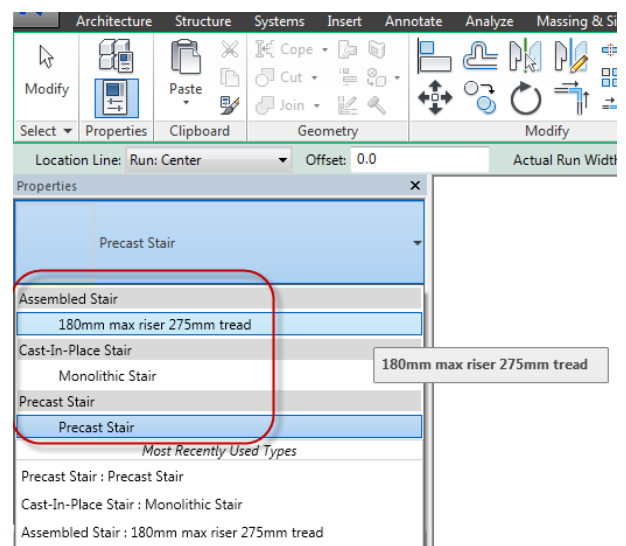
2. Stair by Component

The Stair by Component method allows you to create a stair assembly with common stair elements such as Runs, Landings, and Supports. Each of the three main components has its own system family definition and assignment within the main stair family. You can work in plan views and 3D views as required to create the defining components for any type of stair.

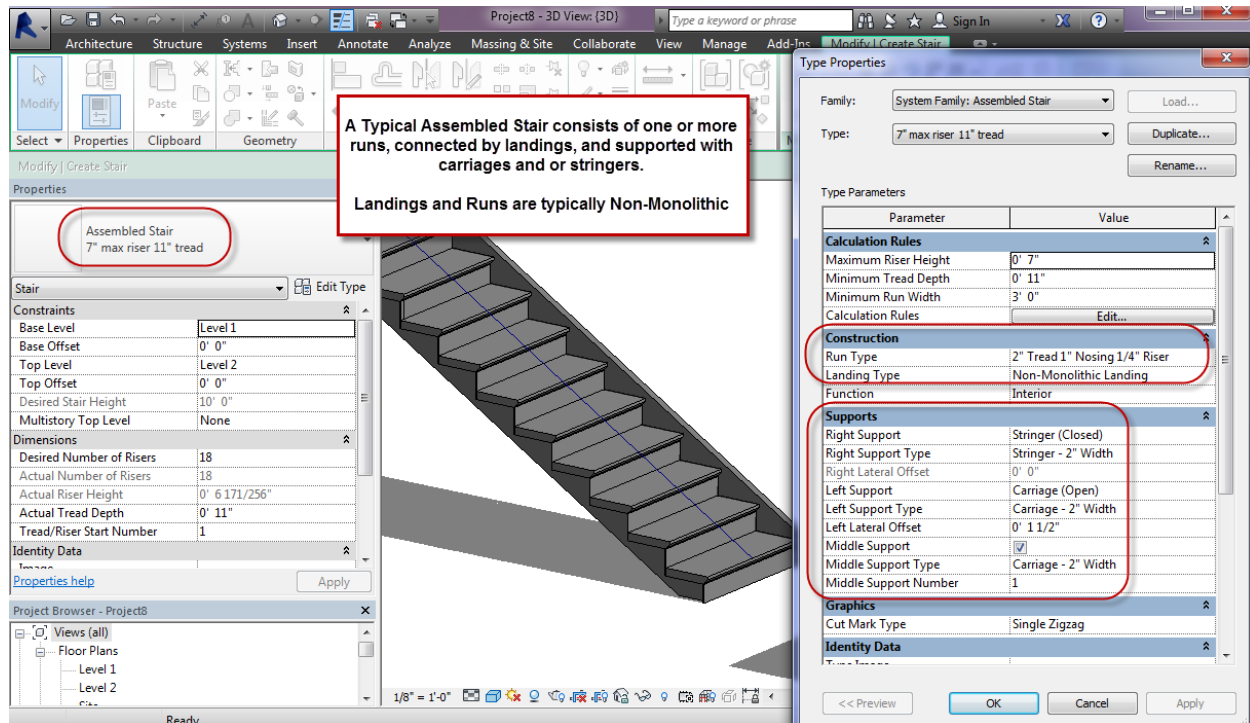


When you create a Stair by Component, you can select from one of three different system families: Assembled Stairs, Cast-in-Place Stairs, and Precast Stairs. These options show at the top of the Properties palette.

After selecting a stair family, use the tools in the components sketch area to define linear or curved runs. You can also use a Sketch tool which will allow you to manually draw a boundary and risers for more complex stairs.



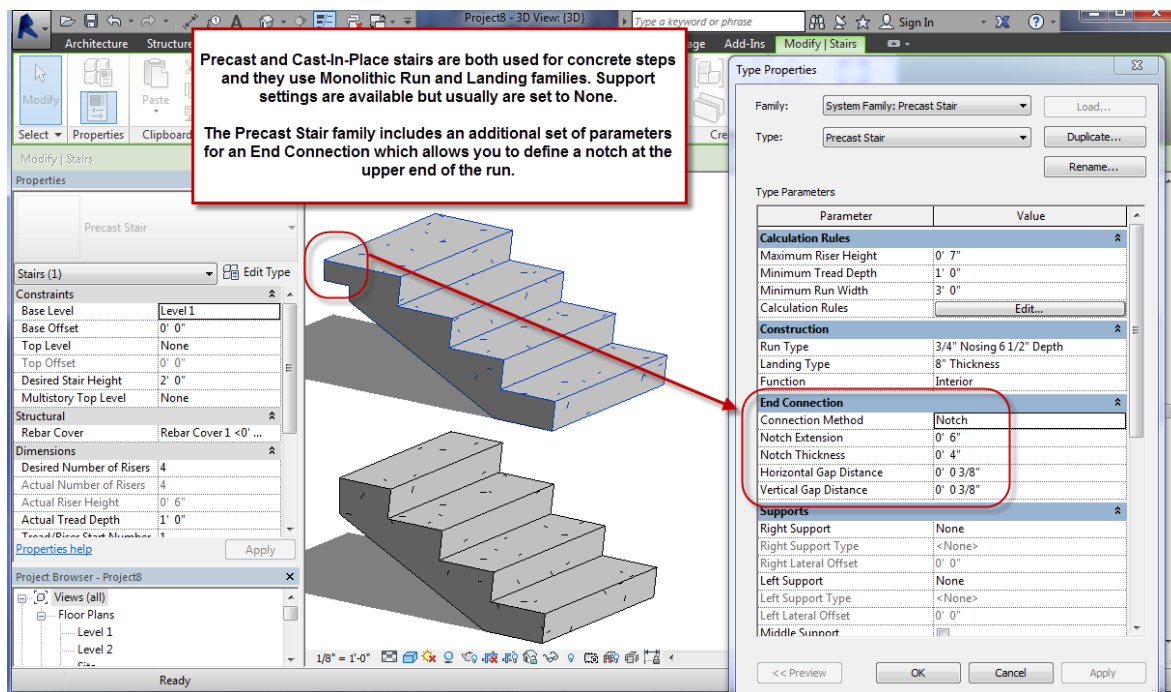
Assembled stairs are the typical stairs you would find in most homes and interior applications. They are usually constructed of wood in residential applications but this type of stair could also be created from steel for industrial or commercial applications.



When you access the Type Properties for the System Family: Assembled Stair, you will select a Run Type, Landing Type, and Supports. The Run type is typically defined with a Non-monolithic Run family with parameters controlling the size, shape, orientation, and materials for Treads and Risers. The Landing type is also typically defined with Non-monolithic Landing family with a Tread setting set to use the same values as the Tread parameters in the Run. If you clear the "same as run" option, you can set the tread parameters independently and vary them from the treads on the run.

Supports have their own category as well and again there are options to load a separate system family called a Stringer (closed supports), or a Carriage (open supports). Different types can be set for left, right, and middle supports. The Stringer and Carriage families allow you to define materials, set any profile to be extruded along the support run, and set options for structural depths for the support.

Cast-In-Place and Precast stairs are typically used for exterior stairs, especially for residential jobs, but may also be used in interiors for commercial or industrial applications. Cast-In-Place and Precast stairs are both created from concrete and are considered Monolithic stairs. They are not assembled from separate parts but are either poured on site or installed as a single, premade unit.



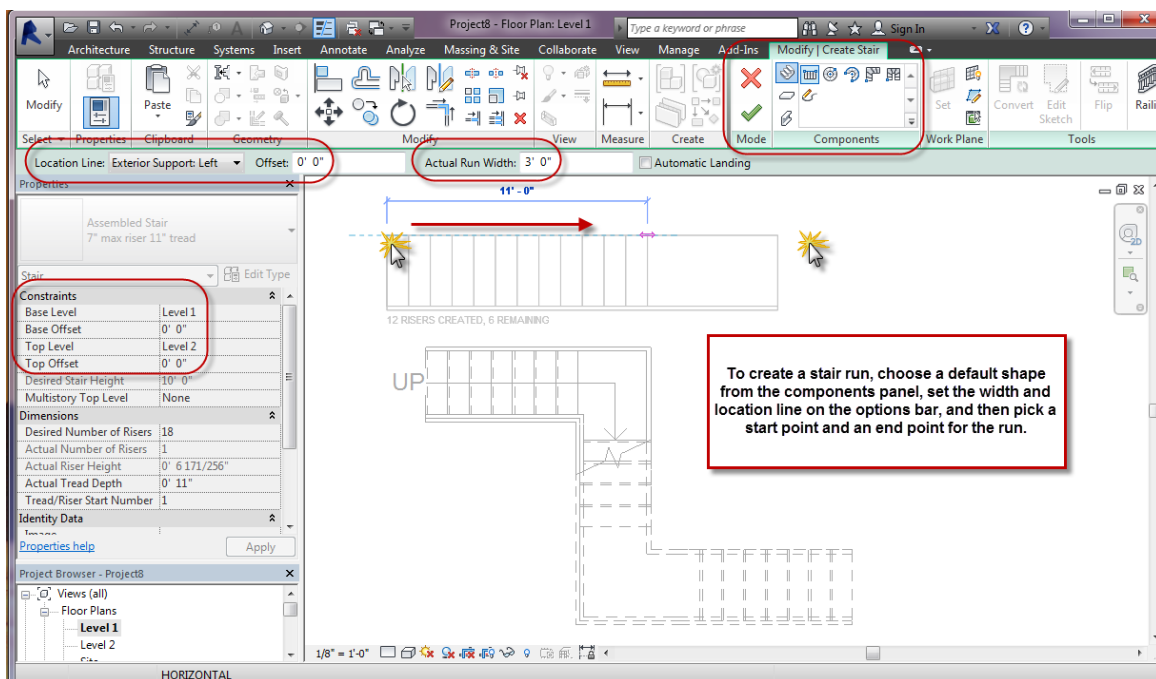
Cast in Place and Precast stairs both use the same set of Calculation parameters as Assembled stairs and both have Run Type and Landing Type parameters although these are typically set to Monolithic Run and Monolithic Landing families. Monolithic Runs and Landings have Tread and Riser settings but these are typically set to None. Construction parameters let you set a depth for the concrete and also assign a material.

Supports are available but are typically set to None for Cast-In-Place and Precast stairs.

Precast Stair families include one additional set of Parameters in an End Connection category. The connection can be set to Notch which will enable values for a notch extension and thickness. Setting the method to Straight cut will disable the notch dimension settings to create the same shape as found on the Cast-In-Place stairs. To use the Notch setting, you must turn off the End with Riser option for stair.

After selecting the desired family and type of stair you wish to create, and reviewing the type properties for Runs, Landings and Supports, check the Options bar to set the location line, offset, and run width, before drawing your first run.

The Run width defines the actual width of the treads and if the stair is using carriage type supports, the run width will be equal to the total width of the stair. If you are using stringer type supports, the stringer width will be added to the run width. If you are using 2 inch stringers on each side, and specify the run width as 3'-0", the total width of the stair, including the supports will be 3'-4".



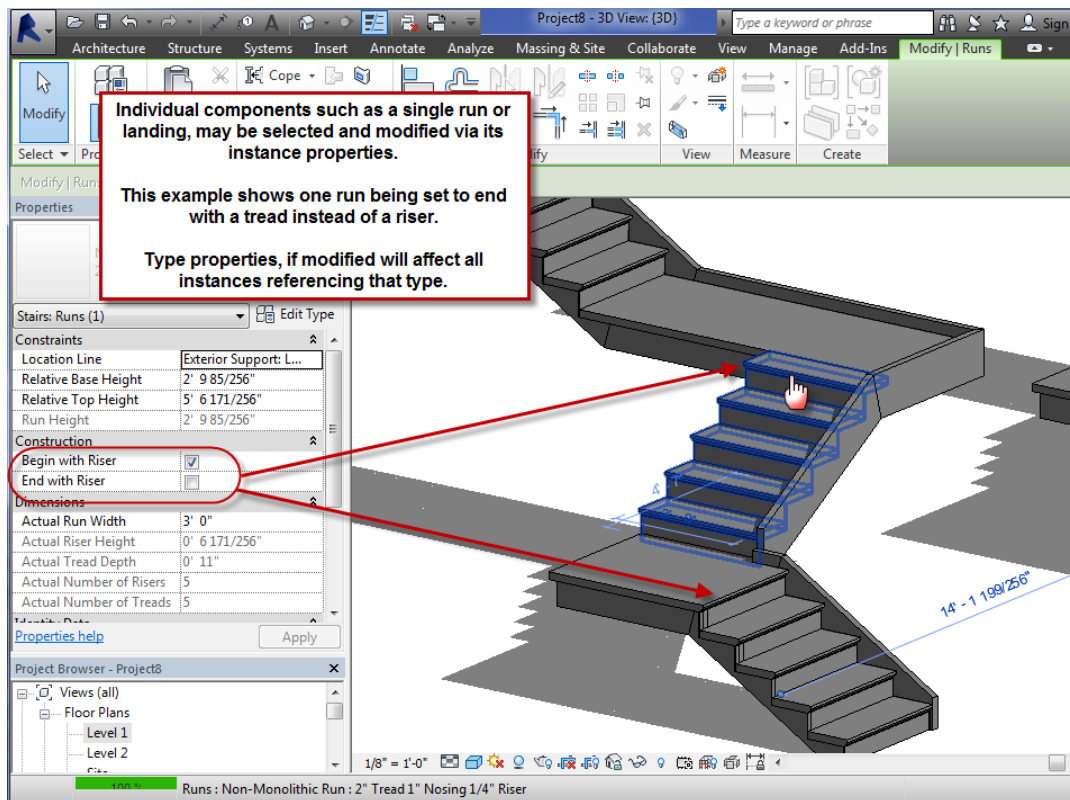
The location line defines where the stair will be attached to your cursor as you pick points. Pick a start point and drag your mouse in the direction of the run and risers will be added automatically with text showing how many have been created and how many are remaining. Pick a second point beyond the extents of the run and a full straight run will be generated.

If your stair will have an intermediate level between runs, you can create a landing between runs by selecting the Automatic Landing option on the Options bar. Each run of stairs will be defined with two picks at the start and end points. Landings will be intelligently connected between the end of one run and the start point of the next run.

The instance properties let you set the Base level and Top level for the stair as well as the desired number of risers and actual tread depth. The Riser height will be calculated automatically by dividing the number of risers into the overall stair height. The minimum tread depth and maximum riser height defined in the type properties will limit the values you can specify in the instance properties.

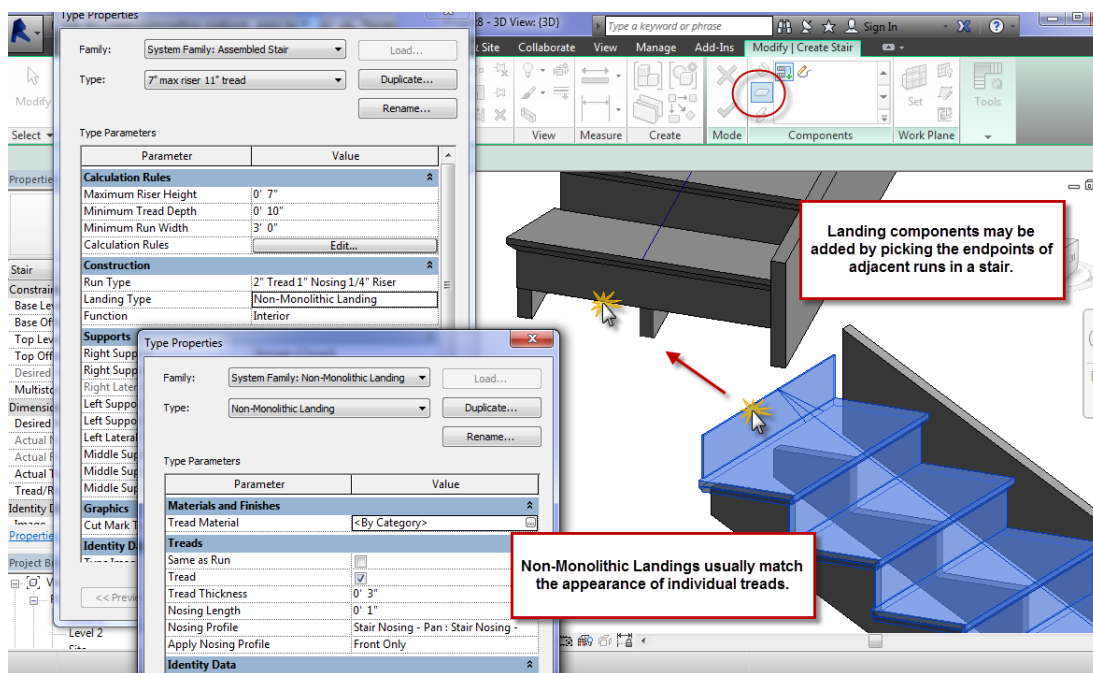
Some changes to the properties for a stair, such as modifying the number of risers or changing the overall height of the stair will also require that you edit the stair in a plan view to adjust the length of a run and remove extra risers.

All of the components that make up a complete stair may be individually selected and modified, even when the stair is not in edit mode. Use Tab Select to pick individual components within a stair.



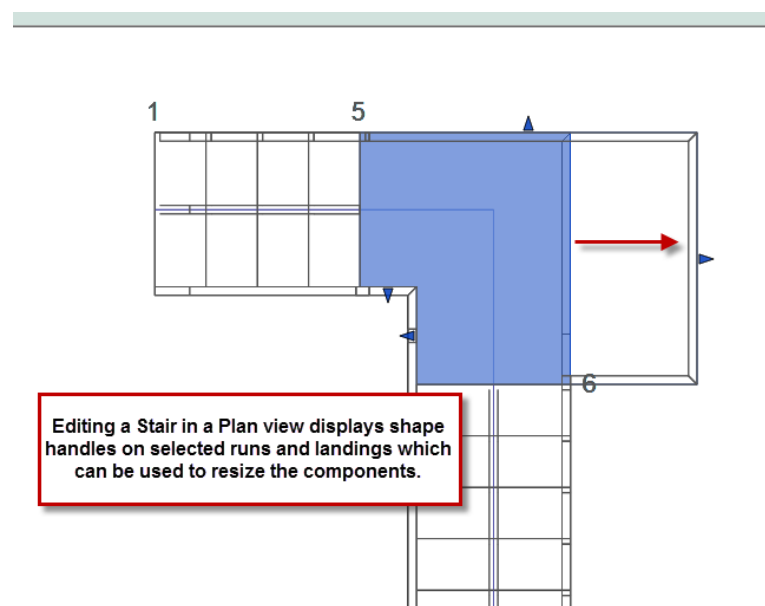
The End with Riser setting allows you to control whether a full tread is added at the top of each run. Normally, end with riser is turned off, which will reduce the overall space requirements for a stair. The landing or the upper floor will act like the top tread in a run.

Landing Components may be added manually with the landing component tool while creating or editing a stair. Common, rectangular landings may be added by picking the top of one run and the bottom of the next. The landing properties will match the run properties by default but may be accessed and modified independently via the Landing type family parameters.

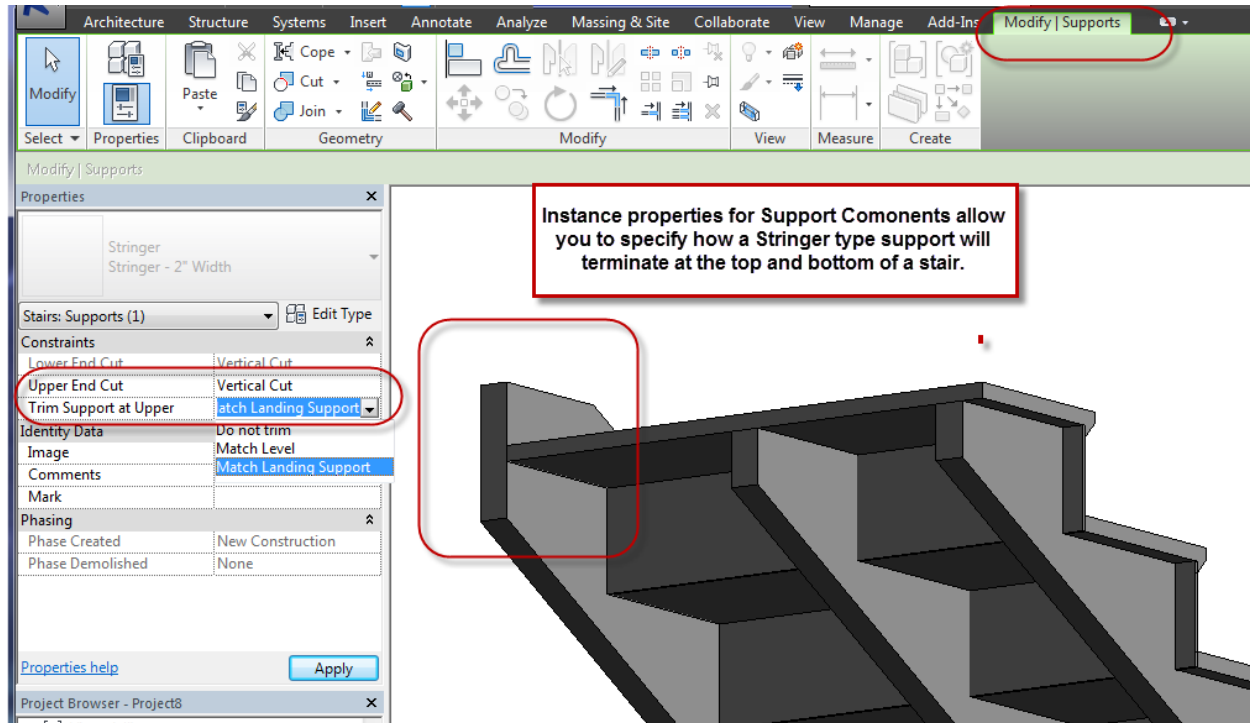


While adding landings or modifying runs or landings, you can work in a 3D view or in a Plan View. Plan views will provide more controls, allowing you to adjust the positions and sizes of runs and landings with temporary dimensions.

Selected landings or runs can be resized or reshaped by dragging shape handles.



Support components use either a Stringer system family or a Carriage system family. Outside supports may be set to None, Stringer, or Carriage on the left, right, or both sides. They can vary on the two sides.



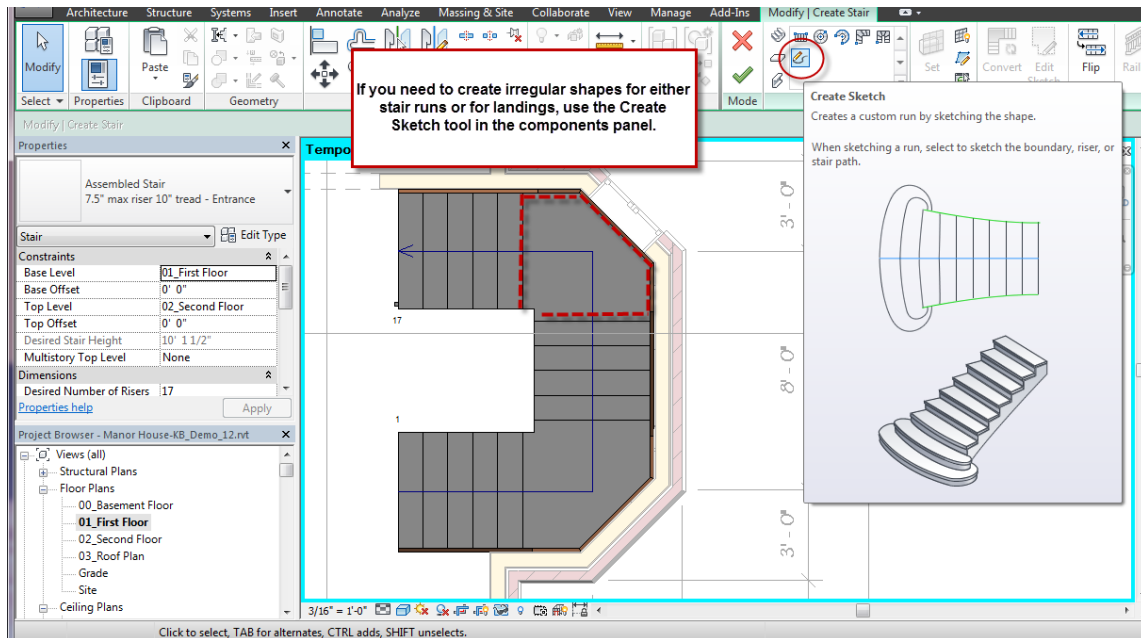
Stringers support the stair treads at one or both sides of the stair. Stringers are closed supports, which will house the tread ends behind or inside a continuous support member. Carriages are open supports, in which the ends of the treads will be visible over a stepped support member.

Middle supports, if enabled, always use the Carriage support type and may be added in the middle of the stair width. These supports are always notched and their thickness will be set by the Carriage type's thickness value. You can choose to enable multiple middle stringers and as you increase the number, the stringers will be equally spaced over the width of the stair.

Lateral offset values are only available when the support type is set to Carriage. The offset allows you to set the length of the overhang for the treads over the sides of the stringers. A distance of zero means the stringer will be flush with the tread end.

Creating Stairs by Sketching Components

When you need to create an irregular shaped stair or if you need more control over the exact placement of your stair components, use the Create Sketch tool on the Components panel to draw the edges of stringers and risers exactly where and how you want them to appear.



Create Sketch will appear for both runs or for landing components and may be combined with common components. You can have two straight, common runs branching off a sketched landing for example.

Sketch tools let you draw the boundary for a landing component, or the boundary and risers for a run component. For a more complex shape it is more useful to first draw the boundary lines and then add the riser lines where you need them.

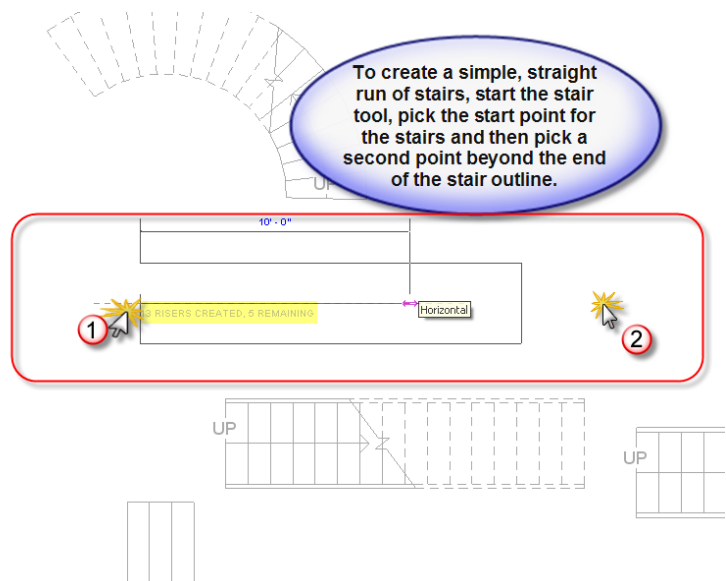
You can start sketching a run and draw the entire stair at the same time. The landings are really just oversized treads so you can do both at the same time. Boundary lines need to be split at the end of each run so the supports will change direction and remain parallel to the run and landing portions.

Risers as well as Boundaries support curved as well as straight edges although for very elaborate conditions, especially curved ones, you may need to do some in-place modeling.

3. Stair by Sketch (Pre-2013 Method for Stair Creation)

In older versions of Revit, the Stair by Sketch tool was the only way to define stairs. In current releases, all of the sketching tools from the original stair creation tool have now been incorporated into Stair by Component. To use Sketches in stairs, the best method is to start the Stair by Component tool, and then choose the Create Sketch option from the Components panel.

In an older version of Revit, to Sketch a run of stairs, select the Stair by Sketch tool and then pick two points to define the start point for the stairs and the end direction for the stairs. After you pick the first point and start to drag your mouse towards the end of the stairs, an outline will appear showing you the overall length of the stairs. A line of text will also appear inside or beside the stair boundary indicating how many risers will be created and how many will remain to be added if you pick a point.

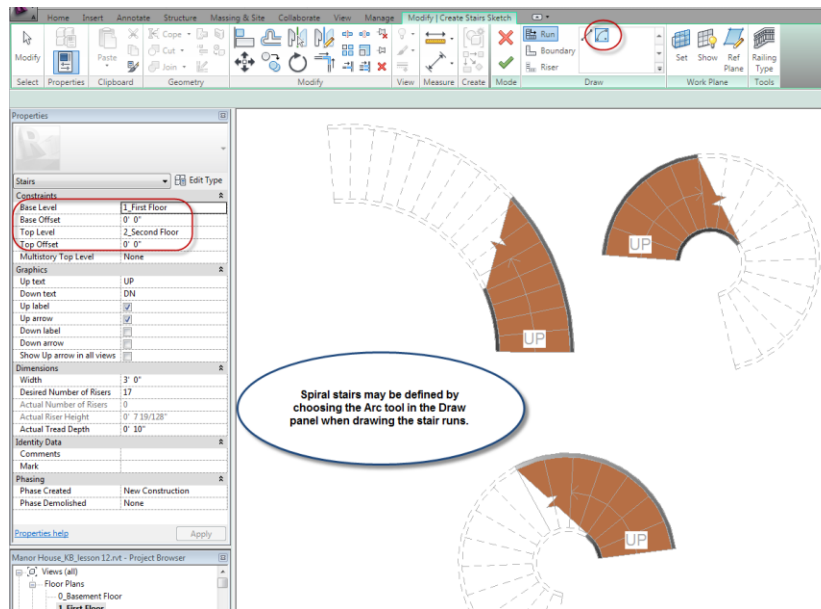


When you sketch a run of stairs, picking the second point any distance beyond the stair boundary will define a full, straight run of stairs. If you pick a point within the boundary, it will define the endpoint for the initial run and the start location for a landing. The next point you pick will define the endpoint for the landing and the start point for the second run of stairs. A second rectangle will appear showing you the potential length of the second run and the riser note will update again to show you how many risers have been created and how many remain to be drawn.

When you define an intermediate landing in your stairs, you can change the direction of the second run by dragging your cursor in the desired direction. To create a U-Shape stair, drag your cursor back in the direction of the initial start point. More than one intermediate landing may be added to a stair by specifying additional landing points within the stair runs.

Spiral Staircases may also be defined with the Run method by starting the Stair tool and then picking the Arc from Center and Endpoints button on the Draw panel of the Ribbon.

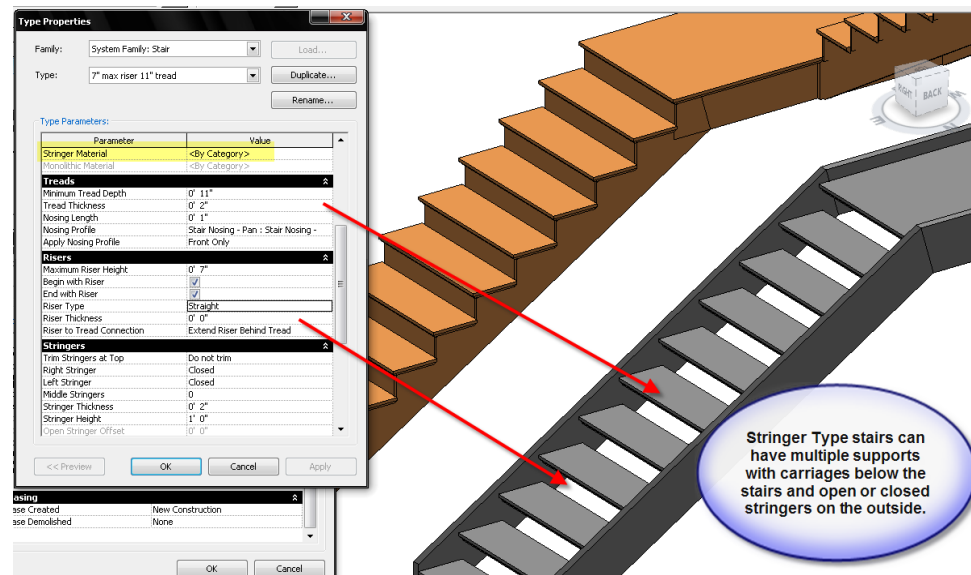
Spiral staircases created with Stair by Sketch, cannot turn through a full 360 degree circle or a greater included angle. The size of the stair and its included angle is a function of the center radius specified along with the floor to floor height as well, as the actual rise and run calculations for the stair. As the radius of the stair gets larger, the included angle will decrease.



Spiral stair runs are created by default as continuous runs but they do support intermediate landings if you specify a common center point for the first and second run.

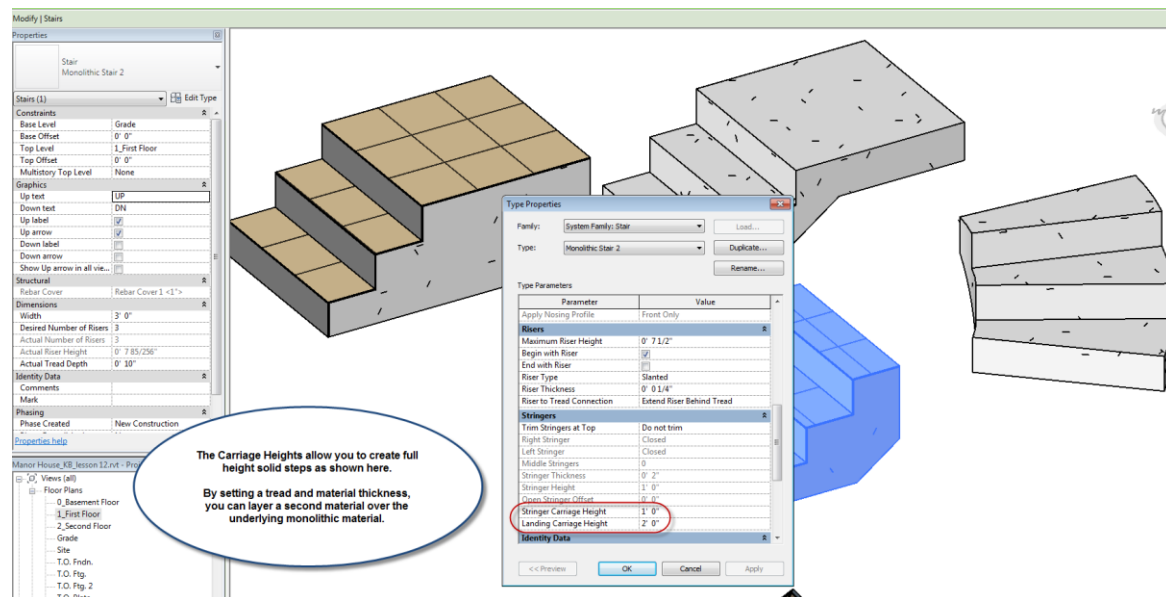
When you sketch a run of spiral stairs, the first point you pick defines the center of the stair. The second point defines the radius to the middle of the stairs as well as the start point for the stair. As you drag your mouse away from the start point of the stairs, the direction will specify the stair as Clockwise or Counterclockwise and you can drag in the opposite direction to reverse the stair direction. As you drag your mouse through the arc run, the riser note indicates again how many risers have been created. If necessary, use the Move and Rotate tools to shift and orient the finished stair in the correct position.

Tread and Riser Stair types are the typical interior stairs that we are used to seeing inside most homes and offices. When you disable the Monolithic stair property, Stringer parameters become available.



Set the Riser type to None to disable risers in the stair as well, a feature common to steel stairs.

Monolithic Stair types are typically used to represent solid, concrete steps. These stair types have a zero thickness tread and Riser and by default have a monolithic material applied uniformly over the stair object.



It is possible to set material finishes for the both the riser and tread components if you change the thickness for these elements. Set the thickness to the depth of the finish material, and assign explicit materials to the Riser or Tread component as required.

Instead of Stringer supports on the sides of the stairs, Monolithic stairs created with the By Sketch method use only a Carriage support. The thickness is automatically set to the width of the stair. The depth of the stringer below the treads and risers is controlled by the Stringer Carriage Height.

To have your stair extend all the way to the base level, set the landing Carriage height to be equal to the overall stair height.

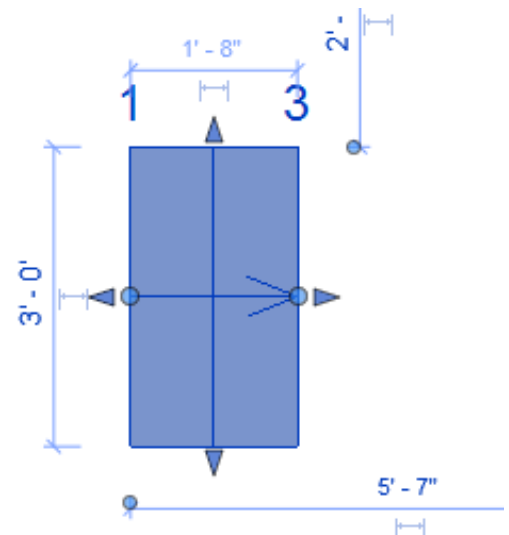
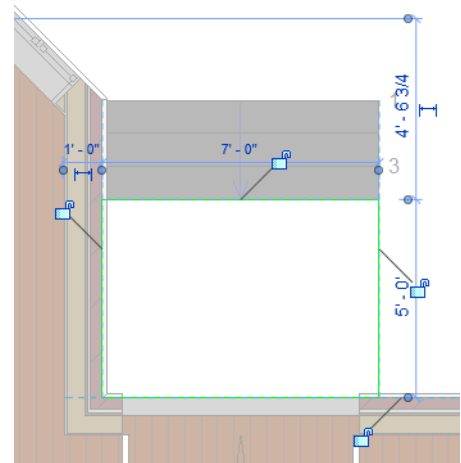
Landings are created at the tops of sketched monolithic stairs by editing the sketch and dragging the top riser line to the depth of the landing. The landing is just a wide top step on the stair. Add segments to the boundary as well to create an offset or custom landing.

Exercise Notes

In the following exercise you will create several stairs in the Manor house project and add floor openings where required.

1. Open the Manor House project and switch to the first floor view. Zoom in to the back of the Great room at the exterior door. From the Circulation panel on the Ribbon, pick Stair by Component. On the ribbon, pick the railings control panel, and set the railing type to None.
2. In the Properties palette, choose Cast-In-Place Stair: Monolithic Stair. Pick Edit Type. Duplicate and create a new type called Concrete Step 1. Set the minimum tread depth to 10" and the maximum riser height to 7 ½". In the Construction settings, set the Function to Exterior.
3. Pick the browser button by Run Type. Duplicate the Run type and create a new one called Straight Riser. Under Treads, set the Nosing length to 0". Set the Riser type to Straight by clearing the Slanted option. Pick Ok twice.
4. Set the Base level to Grade and the top level to First Floor. Set the Desired number of Risers to 3 and the actual tread depth to 10". Leave the Width at the default 3' 0". Check the riser height. Change the number of risers to 4 and apply. Change it back to 3 again and apply. Toggling the number of risers in the stair will ensure that the riser heights are calculated correctly.
5. On the options bar, set the Location Line to Exterior Support: Left. Pick a point at the corner of the wall to the left of the double doors. Drag your mouse up and pick beyond the extents of the stair.

6. Pick the stair run and use the shape handle to drag the width to the far side of the doors. Pick the temporary dimension and set the width to 7'-0". Pick the green arrow on ribbon to finish stair.
7. Notice the DN (down) arrow is pointing towards the house. Pick the stair and then pick the flip arrow so the DN text appears by the door and the arrow points away from house. Switch to a 3D view and zoom in to the new stair at the Northeast corner of the building.
8. To make the step solid all the way to the ground, we can increase the structural depth. Pick the stair and open Type Properties. Edit the Straight Riser run type. Rename to Straight-Riser-Full-Height. Set the structural depth to 1'-10" to match the distance from grade to first floor level. Pick OK and close Type properties. Finish editing the stair.
9. Switch back to the first floor view. Move the stair 5 feet to the north so the front corner aligns with the corner of the 45 degree wall. Pick the stair and then choose Edit Stair on the ribbon. From the Components panel on the Ribbon, choose Landing and then Create Sketch. Draw a 5 foot by 7 foot rectangle with one edge aligned with the top riser on the stair run. Finish the Sketch. Finish the Stair Edit.
10. Switch back to the 3D view. If the landing is not solid all the way to the ground, edit the stair, duplicate the landing type, and create a new one called Full Height that uses a monolithic thickness set to 1'-10".
11. Switch back to first floor and zoom in by the side door under the porte-cochere. Add a second instance of the Concrete Steps as a single run with no landing, centered on the side door. Turn off the automatic landing option. Use the default width of 3'-0" and a top constraint at the First Floor level. Pick the stair run and in the instance properties, select the "End with Riser" option. If the riser numbers now display 3+1 instead of 3 at the top end, pick the stair and then use the circle control grip at the end of the stair path to drag the run back towards its start and remove the top riser. The stair should now 3 risers and 2 treads as shown here. Finish the stair and then move it into position, centered on the side door.

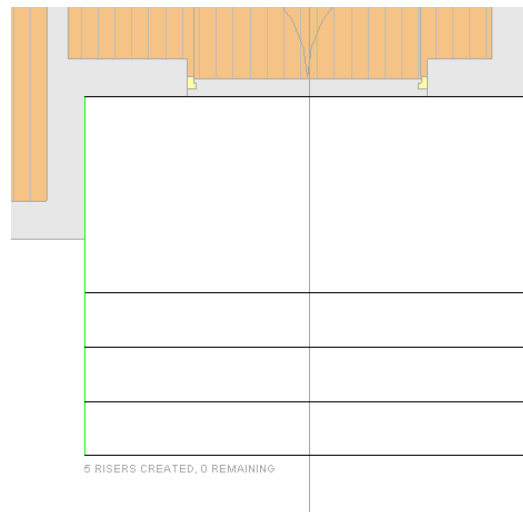


12. Create a third stair at the main front entrance. This time we will use a different method. Start the Stair by Component tool, in the Type Selector, choose Concrete Step 1, and then access the Type properties. Duplicate the type, creating a new type called Stone Steps – Entrance. Edit the properties of the new stair type and set the Minimum tread depth to 1'-1" and the Maximum Riser Height to 6". Set the Landing type to Full Height.

13. Duplicate the Run type and make a new one called Straight Riser-Full Height-Tiled. Turn on the Tread and Riser and set their thickness to ½". Set the nosing length to zero. Change the Tread material from By Category to a new material showing a stone or tile appearance. I brought in Tile, Quarry from the AEC material library. Please note that all custom materials imported from the library should have their texture dimensions review and modified for accuracy. Assign the same material to the Riser and Tread. Pick Ok.

14. Set the base level to Grade and the top level to first floor. Set the desired number of risers to 4 and the actual tread depth to 1'-2". (The rise should work out to 5 ½)

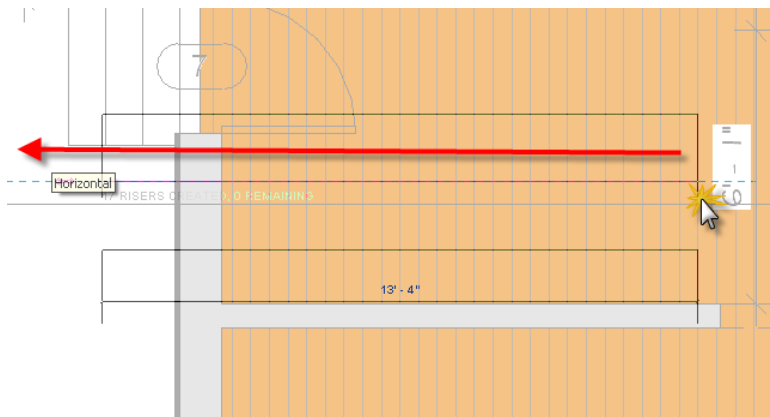
15. Pick the Create Sketch tool in the components panel and then draw the boundary edges and risers as shown. Set the landing depth to 4' 10" and then offset the remaining riser lines at 1'2" spacing. Add an extra riser line along the wall at the end of the landing. Add two more boundary edges at the ends of the risers. Pick Ok and Finish the stair. Accept any warnings and then Tab select the run in the stair and in the instance properties deselect the End with Riser setting.



16. Pick Finish to complete the stair. Take a look at your new stair in a 3D view. Set the shading to realistic so you can see the stone or terracotta tiles you have added. Adjust the material if required.

17. Switch to the first floor view. We'll do a straight stair first, to warm up. ☺ Zoom in to the wall between the dining room and the side entrance. Start the Stair by Component tool. In the type selector pick Assembled Stair 7" riser 11" tread and pick Edit Type.

18. Duplicate the 7" max riser, 11" tread type and create a new stair type called 7 ½" max riser 10" tread. Pick the browse button by Run Type and duplicate and create a new type called 1" tread 1" nosing ½" riser. Set the Tread material, Riser Material, and Stringer material to a wood material of your choice. Set the tread thickness to 1", the riser thickness to ½", and the Apply Nosing Profile to Front and Right. Pick OK.
19. Set the Right Support to Carriage (Open) and the left Stringer to Closed. Duplicate the Support Types and make a new Carriage Support and Stringer support with the width set to 1 ½". Set the Total depth to 11 ¼", and the structural depth to 3 ½". Set the Depth at landing to 7 ¼". Pick Ok. Pick Ok and review the instance parameters. The Base level should be 01 First Floor and the Top level should be 02 Second Floor. The Desired number of risers should show 17.
20. On the options bar, set the Location line to Exterior Support: Left, and the Actual Run Width to 3'-0" Pick Ok and drag out the stair from right to left in a single run. Pick Finish sketch.
21. Use the align tool to move the stair against the wall and 6 inches over from the opening to the Dining Room. Zoom Back out a bit and you should see the Section 1 section line running through the stair. Double click the section head to switch to the Section 1 view. Zoom in around the top of the stair and check for a top tread overlapping the floor system. If so, edit the stair, pick the stair run and in the Properties palette select the End with Riser option. Pick the shape handle by the top riser and drag it back towards the start of the stair until the stringer changes and the top step is removed. Pick Finish to complete the edit and create the stair.
22. At the top of the stair, you can see the stringer support extending above the floor. Pick the stair, pick edit stair, pick the support stringer, and in the properties palette set the Trim Support at Upper to Match Level. Apply and then Finish the stair edit mode.

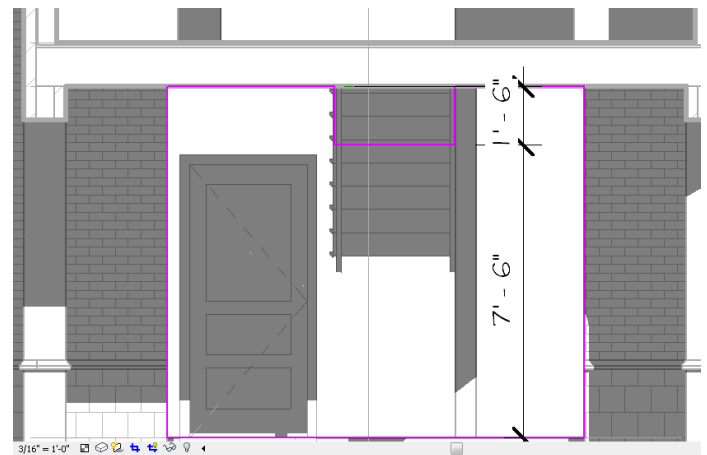
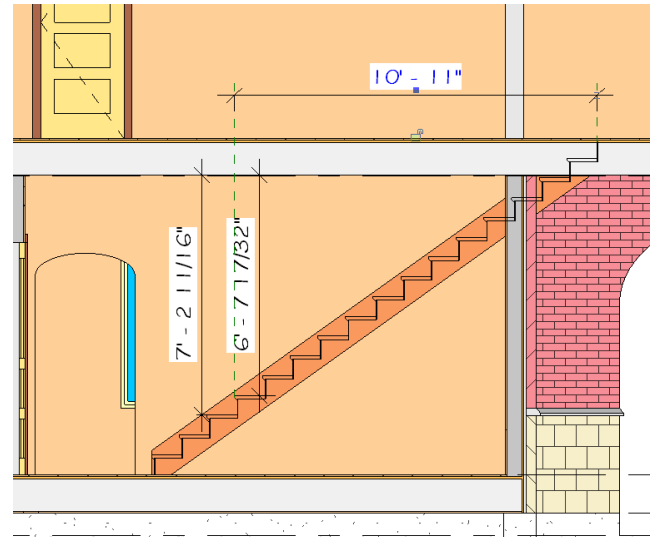


23. Use the section view to help determine the location for the hole you need to cut in the floor for a stair opening. Draw dimensions from the steps to the underside of the floor above to get an idea about the headroom at different locations. Draw two reference Planes to act as guidelines for you when editing the floor.

24. Switch to the second floor view and zoom in around the stair location. The dashed green lines are the reference planes you added in the Section view.

25. Move your cursor over one of the exterior walls until the floor highlights. Pick it and choose Edit Boundary on the Ribbon. The stair and reference lines should both be visible making it easy to trace a rectangle over the stair. I decided to move the reference line out to the 7'2" headroom after seeing the available space on the second floor. Pick Finish Sketch to add the stair opening.

26. Switch back to the Longitudinal Section View so you can see the stair opening. Where the stair cuts through the wall. In this area we're going notch a section out of the exterior wall and later build a bulkhead around this stair where it passes through the exterior in the porte cochere. Again, drawing a dimension in this section view will make it easier to determine the depth of that notch in the wall profile.

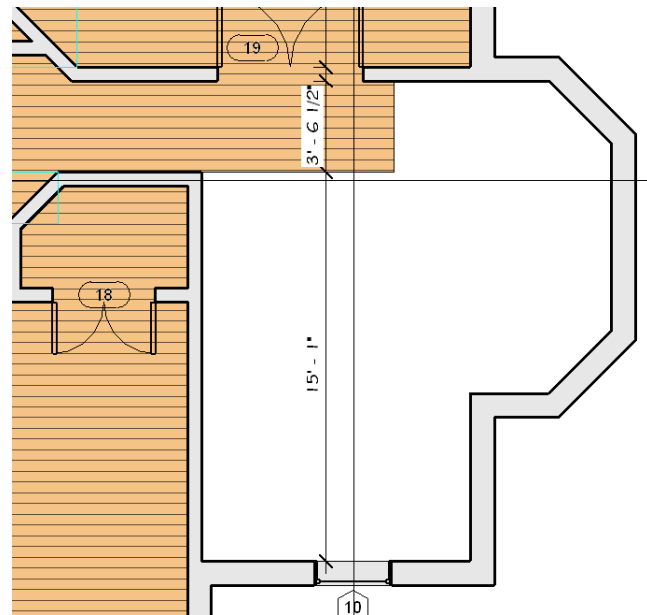


27. Select the wall and choose Edit Profile. Select the Dormer Section view to use to edit the profile as it is already cutting through the passage. If section 2 is not available, switch to the second floor view, flip the section in the direction of the house and then switch to that view and start the wall edit profile again. Add the notch as shown above. Switch to various views to examine the connections. Orient a 3D view to the Section View so you can easily get back to this view for later edits.

28. Switch to the Second floor view. Edit the floor perimeter around the front entrance area to make room for the stairs and Foyer opening. Don't worry about the exact dimension for the edge at the top of the stair as we will fine-tune it after the stair is created.

29. Select the Cross Section section line and flip its direction so it is looking towards the bay section where we'll create the main stair. Reduce the extents of the section.

30. Switch to the First Floor view. Because this stair is very complex with three separate runs and



two custom, angled landings, we will use the Sketch tools inside the Stair by Component method.

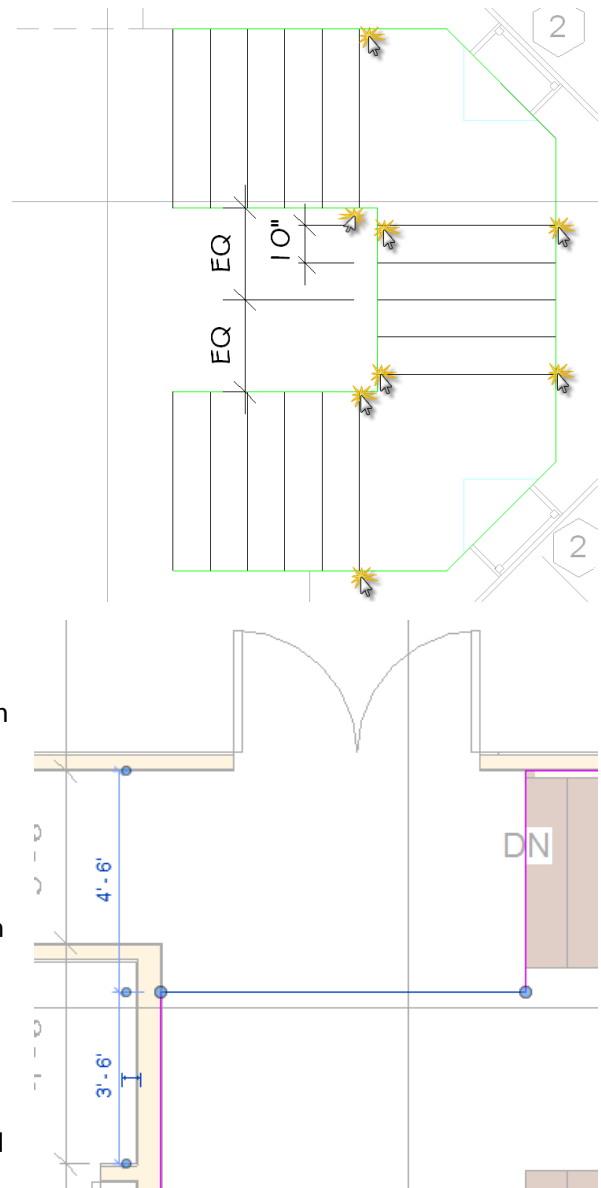
31. Start the Stair by Component tool. Duplicate the 7.5" max riser, 10" tread type and create a new stair type called 7 ½" max riser 10" tread-Entrance. Duplicate the Run type and set the Apply Nosing Profile to Front and Left. Under Risers, change the Riser to Tread connection to Extend Tread Under Riser. Pick Ok.

32. Under Supports, set the Right Support to Stringer (Closed) and the Left Support to Carriage (Open). Set the Stringer thickness to 1 ½". Set the Stringer height to 11 ¼". Set both support types to the 1.5" width variations you created for the back stair. Pick Ok.

33. In the Properties Palette, set the Base level to 01 First Floor and the Top level to 02 Second Floor. Confirm the Desired number of risers is set to 17 and the actual tread depth is set to 10".

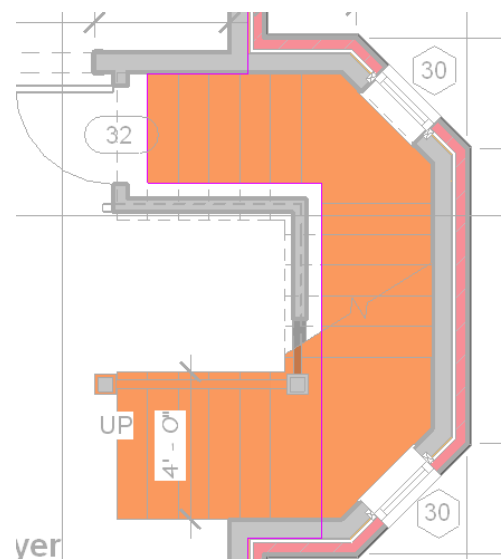
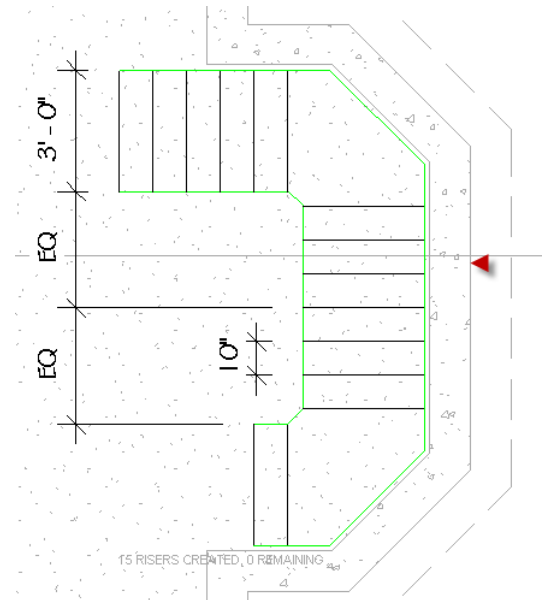
34. With the Run Component selected, pick the Create Sketch tool in the components panel. With Boundary selected, set the Offset to 1.5" on the Options bar, and use Pick Edges to select the edges around the bay. Offset the horizontal and vertical boundary edges in 4 feet towards the inside and trim the corners. The edges next to the wall are offset in 1.5" to allow space for the 1.5" stringer.

35. Select Riser on the Draw panel and use the line tool to draw the first riser line from the midpoint of the short vertical boundary and then start offsetting the riser 10". Check the distance from the top riser in the middle section to the turn and then match that distance to the first riser on the adjacent flights of stairs. Offset the remaining risers.
36. Draw the boundary in separate segments or use the Split tool to break the boundary into sections at the ends of each landing as shown in the image at right.
37. Select the Stair Path tool on the draw panel and add a series of three lines from the bottom of the stair, thru the landings, and ending at the top riser. Pick Finish sketch. In the properties palette, select End with Riser and apply. Pick Finish Edit Mode to create the stair.
38. Switch to the second floor view and edit the floor perimeter as shown here. Finish the Sketch and switch to a 3D view. Orient the view to Cross Section. Swivel the view until you have a good look at the new stair.
39. Select the Section box and use the control arrows to adjust the width of the view so you can see the curved portion of the top landing. Right-click on the view cube and choose to Save the view. Name the new view Entrance Hall. Select the stair and hit CTRL-C or pick the copy to clipboard icon. From the Edit menu, choose Paste Aligned – Select level by name and then pick the basement level and pick OK.
40. Switch to the Basement view. With the new stair in the basement selected, modify the Stair properties and change the top offset to 0". The number of risers will change from 17 to 15. Set the Desired number of Risers to 15 as well.



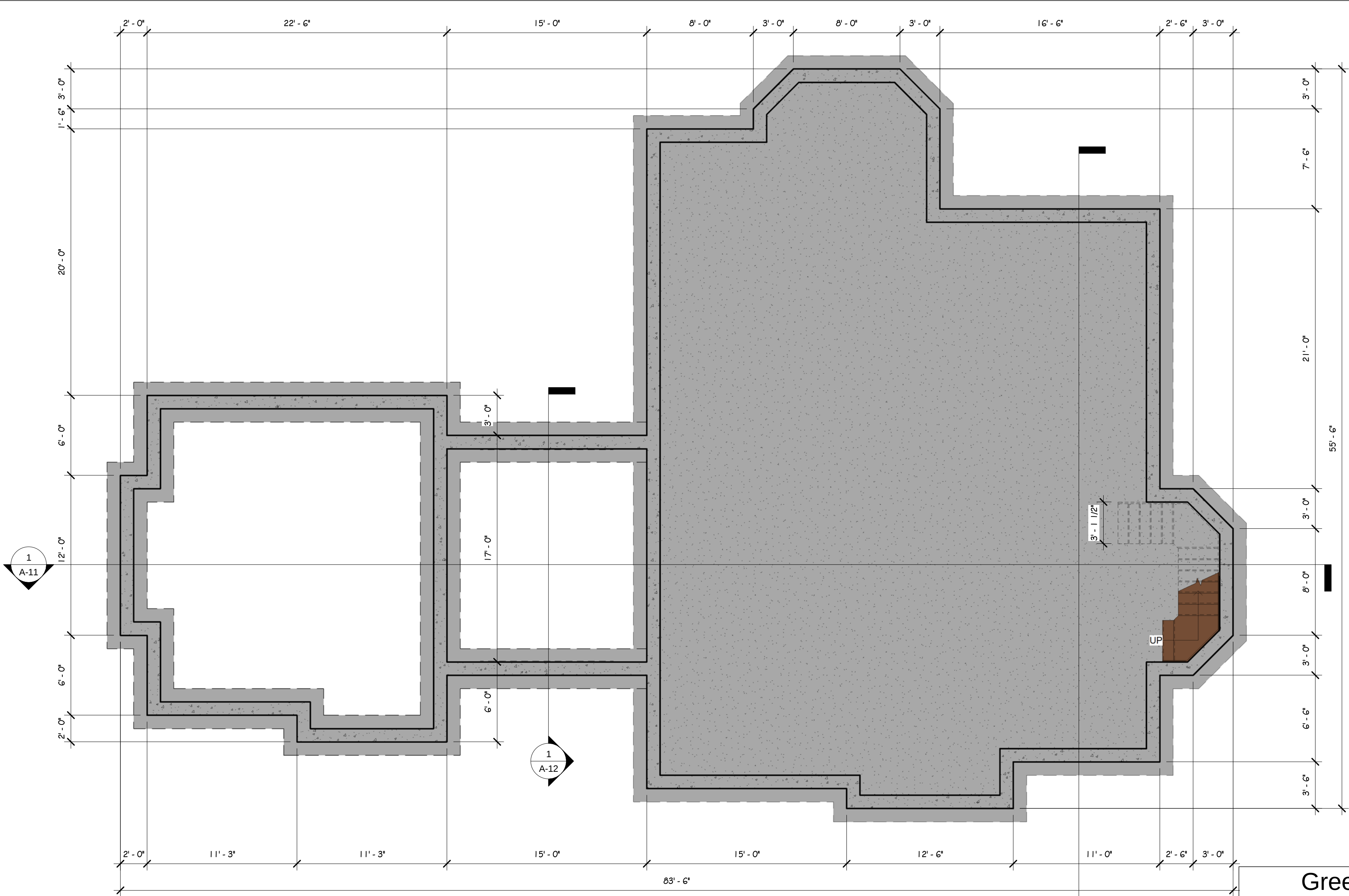
LECTURE NOTES: CLASS 12

41. With the stair still selected, pick Edit Stairs. Pick the stair run and then Edit Sketch from the tools panel on the Ribbon. Modify the sketch of the basement stair as shown at the right. Adjust the width to 3 feet first and then delete the top riser. Start offsetting new risers where required and drag the ends of the boundary lines to the risers.
42. Adjust the split positions defining the landing locations and then finish the sketch.
43. Switch back to the First floor view. Select the floor and pick Edit. Modify the perimeter of the floor to create an opening for the basement stair.
44. Switch to the entrance hall view and orbit the view until you can see the inside of the exterior walls where they connect to the foundation. Select the walls, duplicate their type and create a new variation for this set of walls. Unlock the stud and finish component and the frame wall will extend down to the foundation.
45. Save and close the project.



At the end of this lesson you should have a roof plan, four elevations, two sections and a few 3D views. All concepts demonstrated up to and including the stairs from Lesson 12 should be included.

The Manor House project will be continued in the Level two course, where we will begin with Railings. ☺



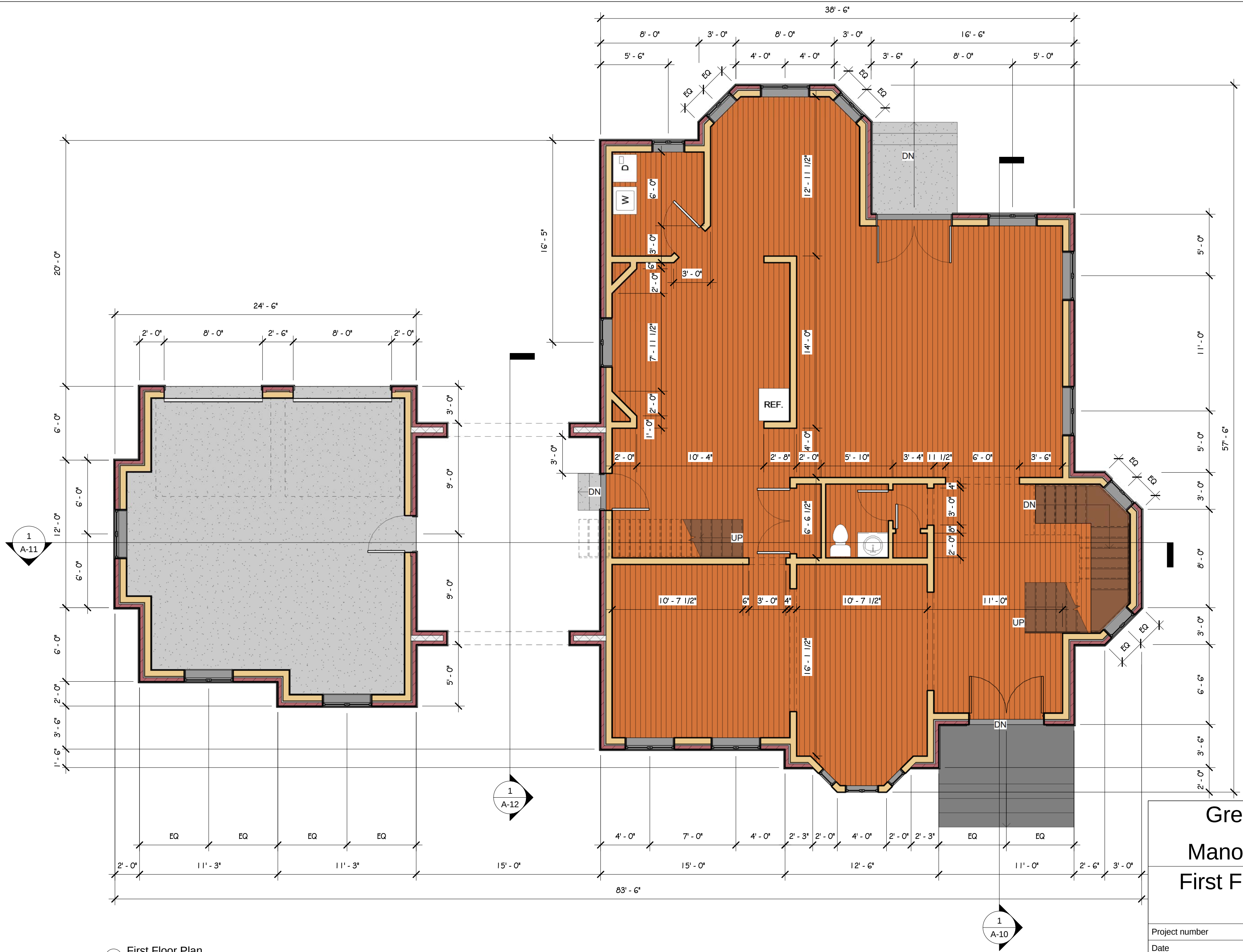
1 Basement Floor Plan
3/16" = 1'-0"

Green Inc
Manor House
Basement Floor
Plan

Project number	2015_001
Date	16/06/2015
Drawn by	KB
Checked by	Checker

A-2

Scale	3/16" = 1'-0"
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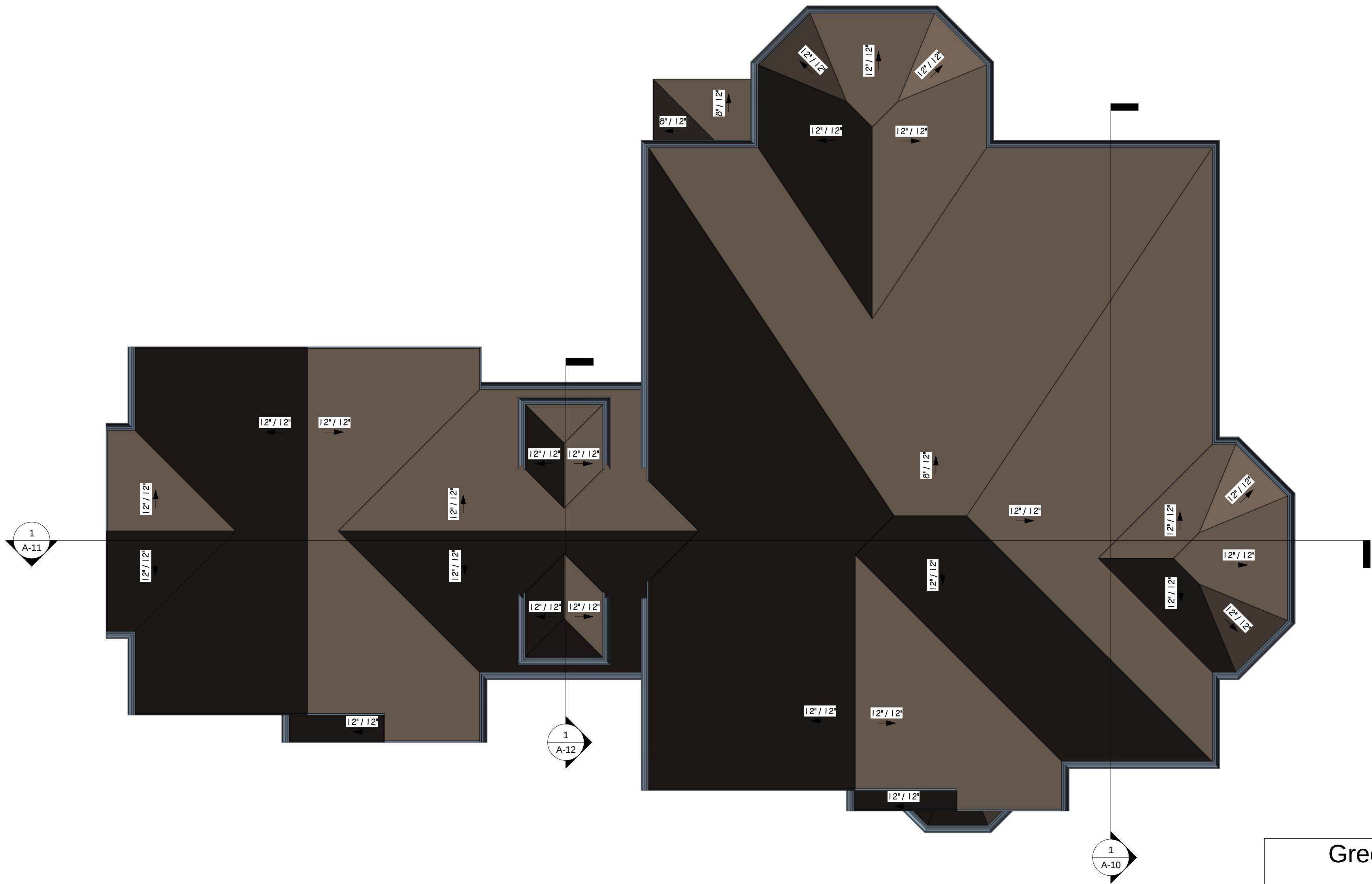
1 First Floor Plan
3/16" = 1'-0"

Green Inc	
Manor House	
First Floor Plan	
Project number	2015_001
Date	16/06/2015
Drawn by	KB
Checked by	Checker
A-3	
Scale	3/16" = 1'-0"



① Second Floor Plan
3/16" = 1'-0"

Green Inc Manor House Second Floor Plan	
Project number	2015_001
Date	16/06/2015
Drawn by	KB
Checked by	Checker
A-4	
Scale	3/16" = 1'-0"



1 Roof Plan
3/16" = 1'-0"

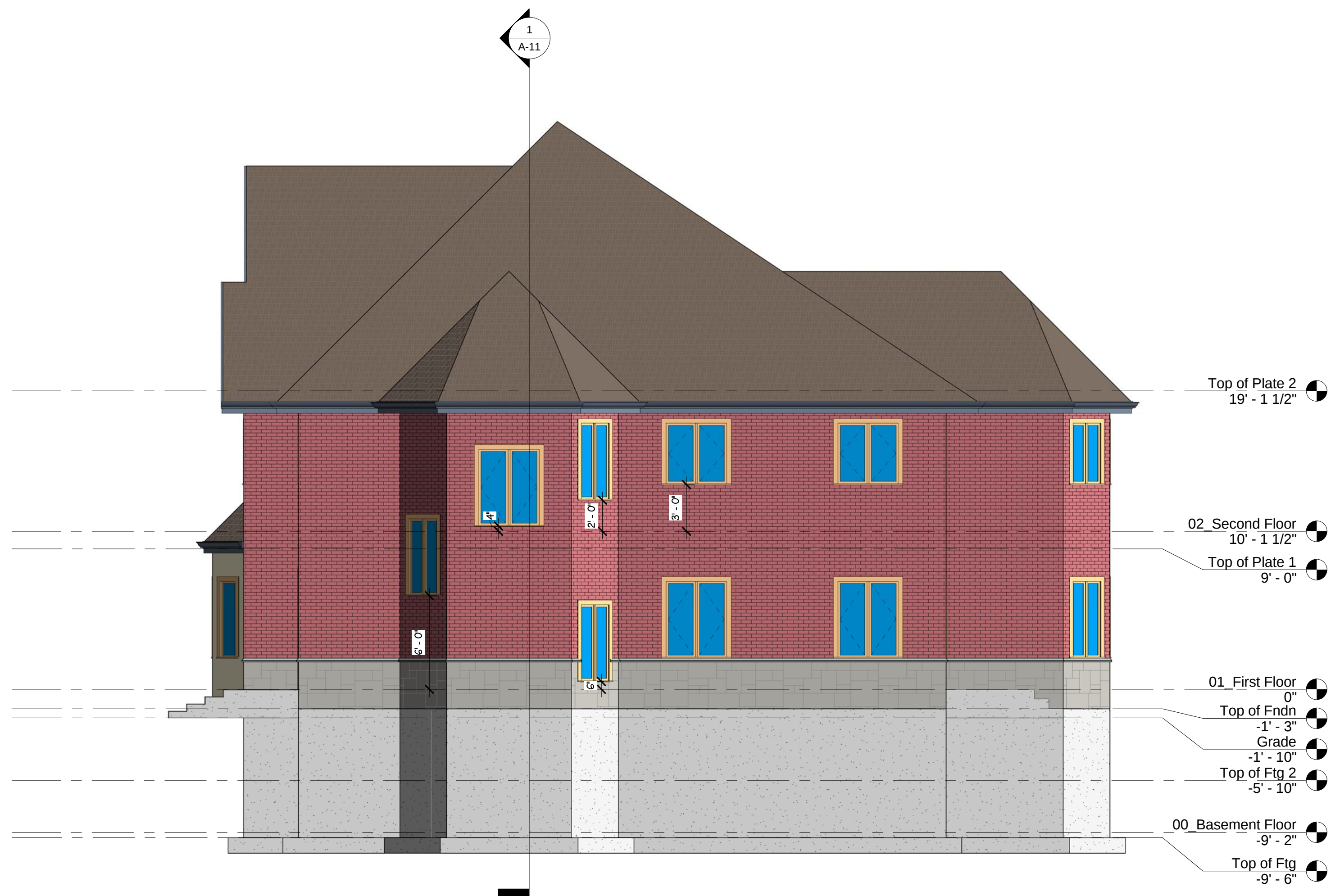
Green Inc Manor House Roof Plan	
Project number	2015_001
Date	16/06/2015
Drawn by	KB
Checked by	Checker
A-5	
Scale	3/16" = 1'-0"



① South Elevation
3/16" = 1'-0"

Green Inc	
Manor House	
South Elevation	
Project number	2015_001
Date	16/06/2015
Drawn by	KB
Checked by	Checker
A-6	
Scale	3/16" = 1'-0"

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① East Elevation
3/16" = 1'-0"

Green Inc
Manor House
East Elevation

Project number	2015_001
Date	16/06/2015
Drawn by	KB
Checked by	Checker
	A-7
Scale	3/16" = 1'-0"

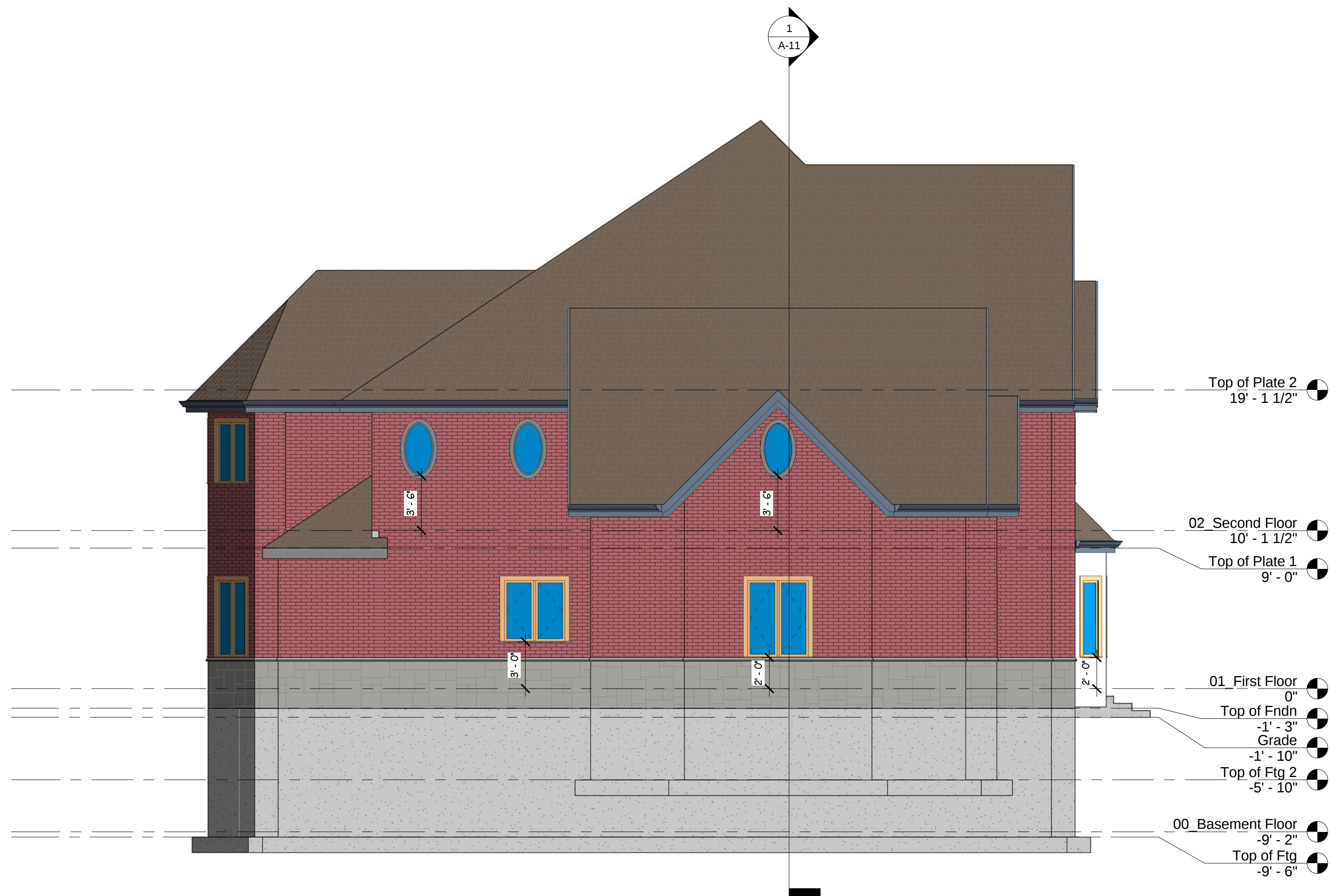
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① North Elevation
3/16" = 1'-0"

Green Inc	
Manor House	
North Elevation	
Project number	2015_001
Date	16/06/2015
Drawn by	KB
Checked by	Checker
A-8	
Scale	3/16" = 1'-0"

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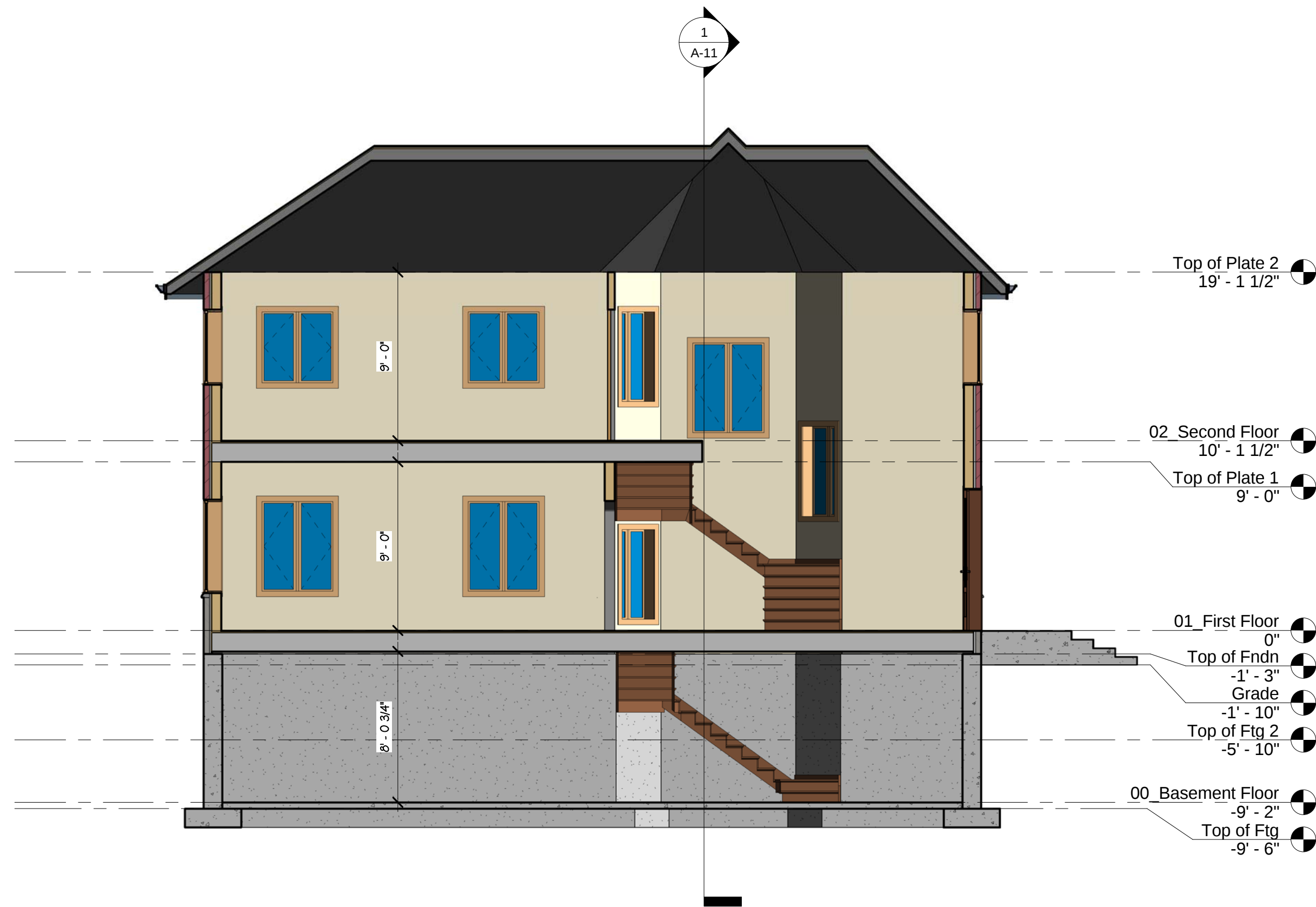


① West Elevation
3/16" = 1'-0"

Green Inc
Manor House
West Elevation

Project number	2015_001
Date	16/06/2015
Drawn by	KB
Checked by	Checker
A-9	
Scale	3/16" = 1'-0"

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① Cross Section
3/16" = 1'-0"

Green Inc
Manor House
Cross Section

Project number	2015_001
Date	16/06/2015
Drawn by	KB
Checked by	Checker
A-10	
Scale	3/16" = 1'-0"

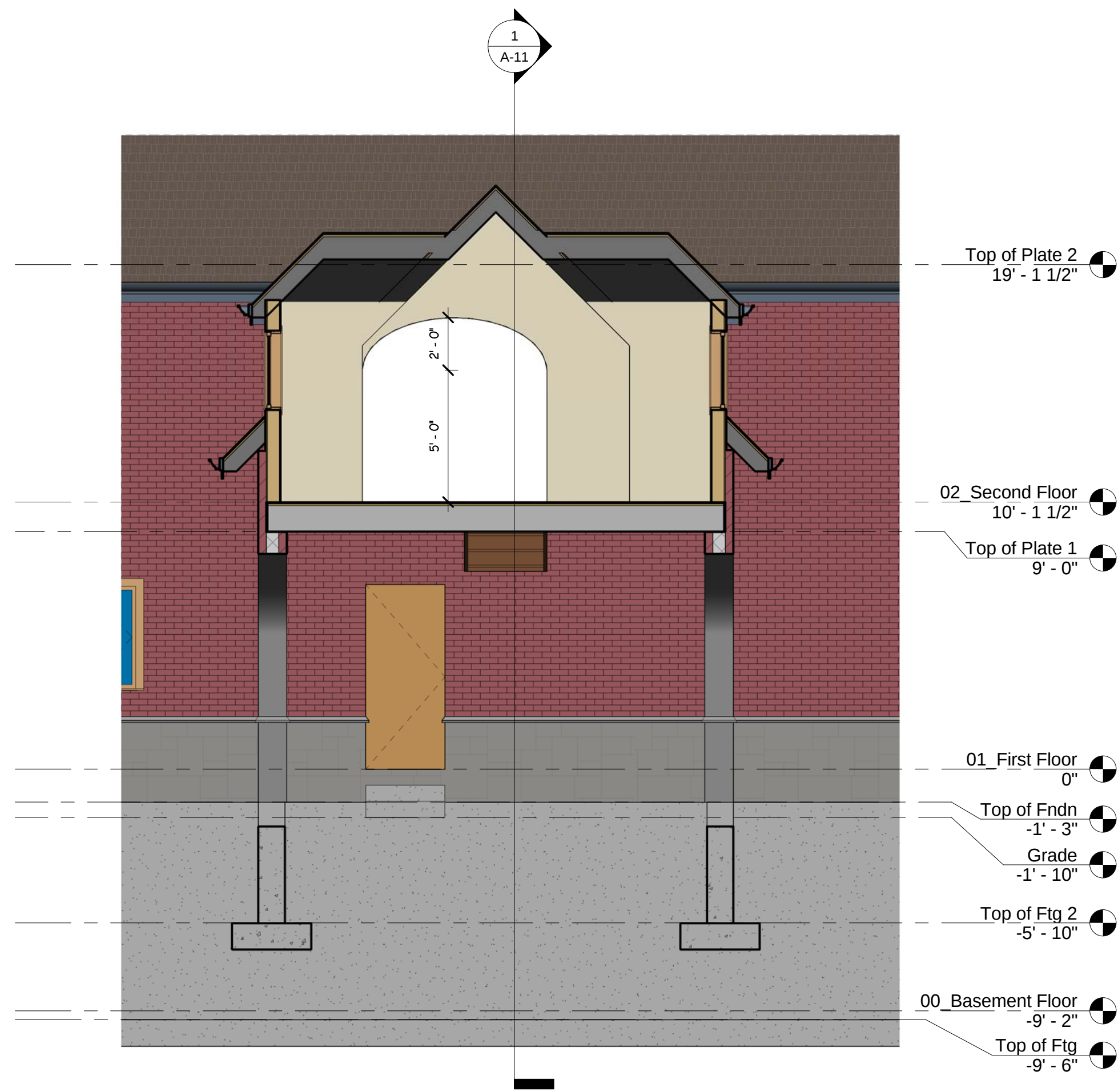
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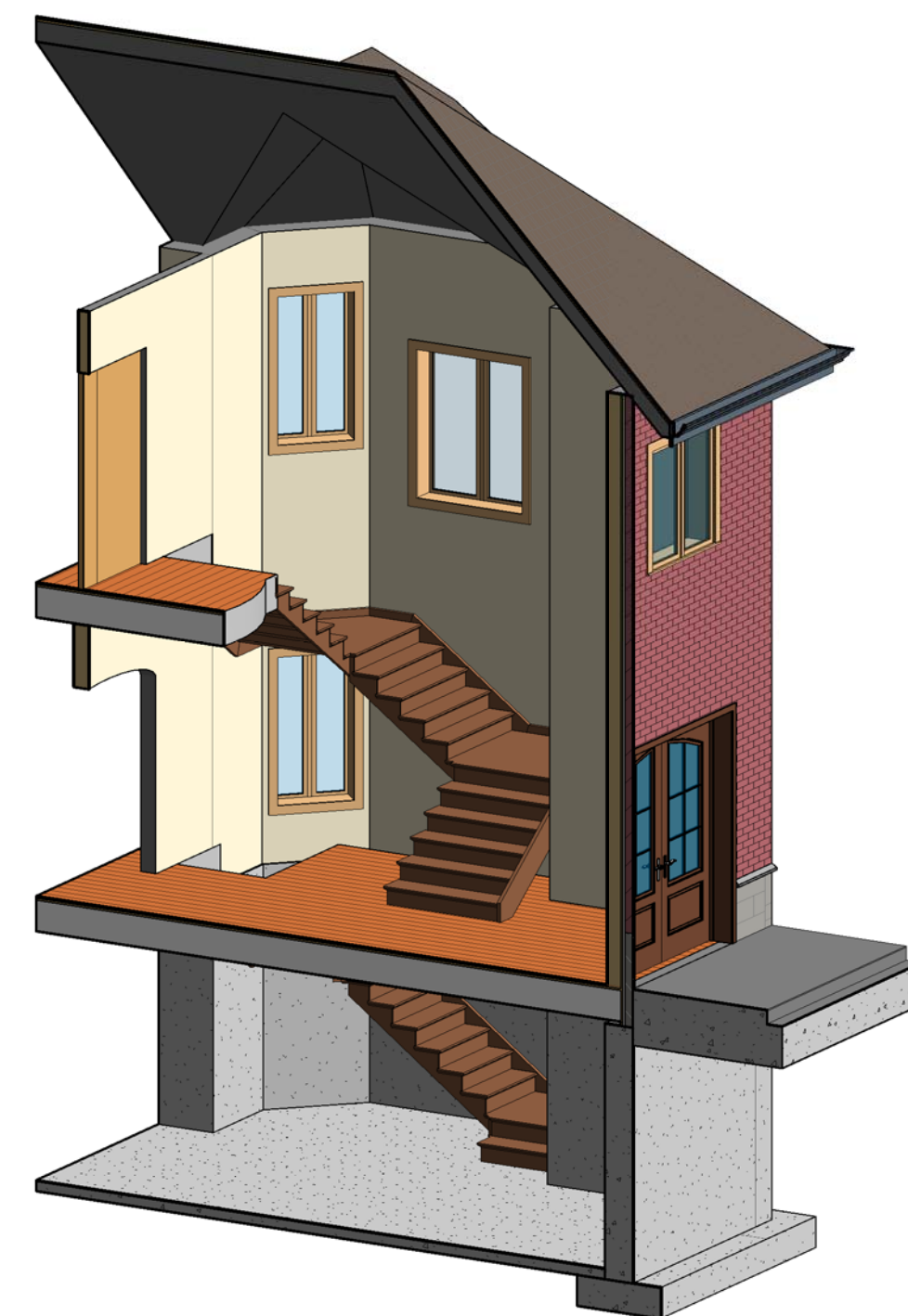
① Longitudinal Section
3/16" = 1'-0"

Green Inc	
Manor House	
Longitudinal Section	
Project number	2015_001
Date	16/06/2015
Drawn by	KB
Checked by	Checker
A-11	
Scale	3/16" = 1'-0"

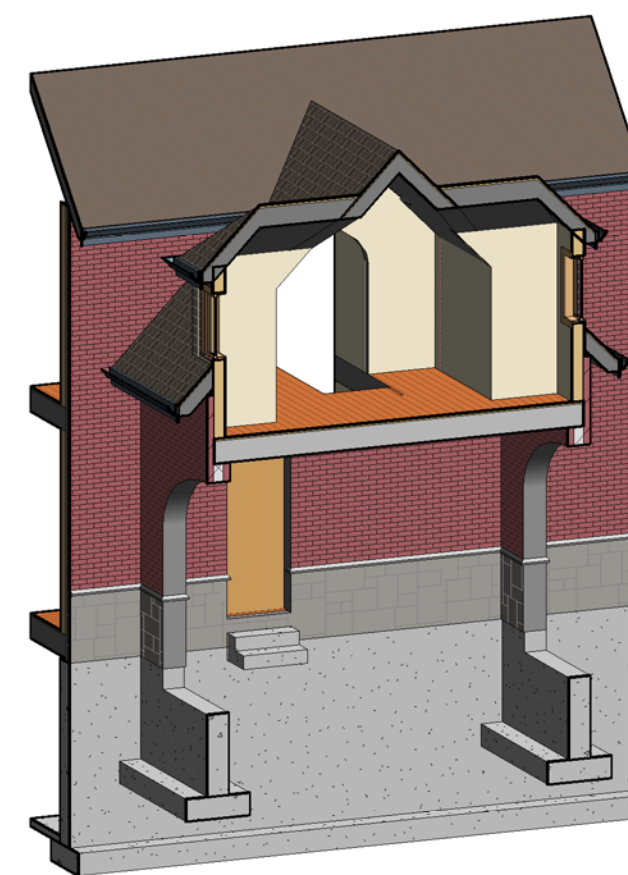
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① Dormer Section
1/4" = 1'-0"



② 3D Entrance Stair



③ 3D Dormer Section

Green Inc	
Manor House	
Dormer Section and 3D Sections	
Project number	2015_001
Date	16/06/2015
Drawn by	KB
Checked by	Checker
A-12	
Scale	1/4" = 1'-0"

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